Alternative #4 Two Cell at $80M/Year
Basis of Estimate

Alternative #4 Two Cell includes hydraulic dredging of upper harbor (UH) Superfund material for landfill disposal, construction of a Lower Harbor CAD Cell (LHCC) for disposal of lower harbor (LH) Superfund material and uncontaminated material from construction of an Upper Harbor CAD Cell (UHCC). Excavation of contaminated wetlands will be performed by mechanical dredging with disposal of the material to a hazardous waste landfill. This particular estimate for Alternative #4 Hybrid assumes a funding scenario of $80M/year. The following activities and assumptions are included in the cost estimate.

Hydraulic Dredging Years 1 and 2

The TSCA hydraulic dredging task was estimated assuming 24-hour operation. The operation costs were based on the 2008 dredge season proposal. Hydraulic dredging volume and volume per day (cy/day) were increased by 80% to account for the double shift for a rate of 882 cy/day. Operational Sampling & Analysis costs were also increased by 80% to match hydraulic dredging volumes. The total MU volume to be dredged hydraulically was increased from the volumes reported in the *Volumes, Areas and Properties of Sediment by Management Units* report to incorporate volume from cleanup passes. Sediment Sampling & WQM and Database O&M and Web costs were increased by 50% for the larger dredge areas.

Planning and Reporting costs were increased by 75% from the $15M/year scenarios to handle the effort related to multiple dredge areas that result from longer dredge seasons. Planning and Reporting costs were increased by an additional 100% in the final year for project closeout and documentation purposes. Project Management costs were increased by 54%/year (additional 28 weeks) to account for 40 weeks of activity per year instead of 12. NAE costs were increased by 50%.

Mobilization costs were increased by approximately $800K for the additional equipment required on site with expected higher maintenance demands.

O&M costs were increased by $55K/month from the $15M/year scenarios for a period of 9 months per year in Years 1 and 2 to cover the increased costs of 9 additional processing months per year.

NStar Crossing

The NStar Crossing cost was increased from a 2007 estimate of $1.2M due to an assumption that copper costs will increase. As discussed in a meeting with EPA, NAE and Jacobs on 01 February 2009, the estimate is $3M in 2009 dollars.

LTM

The Narragansett LTM is performed periodically by EPA, and is scheduled to be performed in Years 1 and 5. The basis for the cost is an EPA e-mail dated 23 January 2009.

Build LHCC

The cost to construct the LHCC is based on a $30/cy fee calculated from an e-mail sent by EPA on 11 December 2009. It is assumed that the material from the mechanical dredging of LH MUs will be placed in the LHCC. Therefore, the construction volume of the LHCC is based on the volume of mechanically dredged material to be disposed of into the LHCC, which is expected to be 271,589 cy, but rounded up to 300,000 cy per EPA direction on 15 May 2009.

It is assumed that the 300,000 cy of glaciofluvial material from the LHCC construction will be used for **Mudflat Restoration** in the upper harbor. An escalated unit rate for the Cap MU1-16 activity from Alternative #2 has been used to estimate a cost for the Mudflat Restoration activity.

Purchase Marine Equipment

In Year 3, prior to mechanical dredging, marine equipment that will be used for the mechanical dredging tasks must be purchased. The cost for the marine equipment is the same basis as was used in Alternative #2.

TERC Recompete

Based on assumptions by EPA and NAE, the existing TERC contract will be re-competed in 2011. The cost associated with re-issuing a contract was provided by NAE.

Demobilize Areas C & D

When hydraulic dredging is complete, Areas C and D will be demobilized. All dredging and dewatering equipment will be decontaminated and removed. Facilities to support the mechanical dredging and wetland restoration will remain at Area C. Previous estimates included a separate cost to prepare Area C for mechanical dredging. This separate cost item is now included in the demobilization cost.

Install/Remove Silt Curtains

Silt curtains will be required during construction, filling and capping of both CAD cells. The costs to install and remove the silt curtains are modifications to the cost for installing a perimeter sheet pile wall around the CAD cell from Alternative #2. Similar equipment

would be required as with the perimeter wall, but the number of sheet piles is reduced and the installation duration is estimated to be 30 days instead of 72 days for each silt curtain.

The removal cost also includes capping the CAD cells. For **Capping the LHCC**, EPA has requested the glaciofluvial material recovered from building the UHCC be used to cap the LHCC. This activity will take place immediately following filling the LHCC with UHCC organic material in order to expedite the construction of the UHCC; the material in the LHCC will not be allowed to settle for 1 year prior to capping. The cost for capping the LHCC using UHCC glaciofluvial material was developed by a dredging contractor for hydraulically removing the material from depth and re-broadcasting it downstream.

For **Capping the UHCC**, the silt curtain removal cost includes the capping cost and assumes 60,000 cy of 3-inch bank run gravel and includes this at a cost of $18/cy. The material in the UHCC will be allowed to settle 1 year prior to capping.

Mechanical Dredging Lower Harbor MU32-37

This task would be subcontracted out to a dredge company. The material would be excavated with a clamshell and placed into a bottom dump scow. Unlike Alternative #2 estimate which assumed 24-hour shifts, the shifts would be 12 hours/day and the production rate would be 1,400 cy/day. The rates used for this task are similar to other USACE projects and modified from Alternative #2.

Fill LHCC with UHCC Organics

The non-Superfund material overlying the glaciofluvial material of the UHCC will be disposed of in the LHCC. The capacity of the UHCC is required to be 225,252 cy to accommodate the UH MU material not removed hydraulically in Years 1 and 2. Therefore, there are estimated 51,429 cy of organic material that will be mechanically dredged from the UHCC and placed in the LHCC. Because of the restriction imposed by the Coggeshall St. Bridge and Route 195 Bridge, small scows must be used to transport the organic material from the UH to the LH. Similar activities in previous cost estimates assumed 12-hour work days, 5-day work weeks with a production rate of 500 cy/day. This 2-cell $80M/year estimate assumes 24-hour work days, 5 days per week in order to utilize the funding available. The production rate is assumed to be 1,000 cy/day.

Mechanical Dredging Upper Harbor MU25-31

Superfund material not removed by hydraulic dredging will be mechanically dredged and placed in the UHCC. To utilize available funding, this estimate assumes 24-hour work days, 5 days per week. The production rate is assumed to be 1,000 cy/day.

Alternative #4 Two Cell at $80M/Year
Basis of Estimate

Empty Cell #1 and Cap DDA

The cost estimate to remove the material from Cell #1 assumed 23,000 cy of material disposed of as 15,000 tons of mixed waste and 19,500 tons PCB-contaminated material, 12-hour days, 5 day weeks. At a removal rate of 500 tons/day, this activity would take approximately 3 months.

The cost for capping the DDA was taken from a cost estimate developed for EPA in February 2008 ("Cost Estimate 2bcf").

Marsh Island Restoration

The NAE estimated the cost for the Marsh Island Restoration in 2007 at $2.61M. On 15 December 2008 EPA suggested increasing the cost to $2.75M to cover oversight and other costs.

Due to the proximity of Marsh Island to the lower harbor MUs, this activity would have to occur after all the mechanical dredging is completed.

Wetlands Restoration

A detailed cost estimate for wetlands restoration was developed for EPA in December 2007 ("Cost Estimate 1b"). The estimate included building temporary roads to access the wetlands, removal and T&D of material, backfilling, planting, and temporary road removal. The 2007 cost estimate was modified for this Alternative #4 Two Cell cost estimate by adjusting the wetlands area from *Volumes, Areas and Properties of Sediment by Management Units*, likewise adjusting linear feet of access roads, and including installation of silt curtains around the excavation areas.

This activity could occur simultaneously with dredging the lower harbor MUs, but is included after mechanical dredging for the purposes of simplifying this estimate. The upper areas would be started first. Parts of this activity, such as restorative planting, would likely be planned for optimum growth seasons.

Additional Assumptions

- $250K of confirmational sampling (total) was added at $50K/year per discussion on 01 February 2009 with EPA, NAE and Jacobs.
- Remaining funding (or funding needed) in a given year was added (or subtracted) to the following year's funding.
- Project closeout costs assume the Planning & Reporting costs are double in the final project year.
- The maximum number of subsequent work days per year is assumed to be 220 (11 months).

NEW BEDFORD HARBOR
ALTERNATIVE #4 2 CAD CELL SCENARIO

Funding Scenario - $80 MIL/YR, 3.5% Escalation
-30%/+50% Accuracy

$ 341,199,704 = TOTAL COST
$ 319,989,118 = NET PRESENT VALUE

YEAR #	1	2	3	4	5
ACTIVITY	Hydraulic Dredging, Nstar Crossing, LTM	ESD Signed Hydraulic Dredging, Begin Build LHCC	TERC Recompete, Finish LHCC/Mudflat Resto., Demob C&D, Purchase Marine, Install LHCC Silt Curtain, Fill LHCC with LH MUs	UHCC organics, Remove Silt Curtain and Cap LHCC, Install UHCC Silt Curtain and Begin Fill UHCC with UH MUs, Begin Wetlands and Marsh Is. Resto.	Complete Fill UHCC with UH MUs, Complete Wetlands, Remove Silt Curtain and Cap UHCC, Empty Cell #1 & Cap DDA, LTM, Project Closeout
YEAR	2009	2010	2011	2012	2013
FUNDING	$ 80,000,000	$ 84,818,145	$ 80,535,437	$ 110,940,372	$ 127,835,495

FIXED COSTS					
PLANNING & REPORTING	$ 392,325	$ 406,057	$ 420,269	$ 434,978	$ 900,404
PROJECT MANAGEMENT	$ 2,655,539	$ 2,748,483	$ 2,844,680	$ 2,944,243	$ 3,047,292
MOBILIZATION/DEMOBILIZATION	$ 3,462,662	$ 3,583,855	$ 3,709,290	$ 3,839,115	$ 3,973,484
OPERATIONAL SAMPLING & ANALYSIS	$ 126,855	$ 131,295	$ 135,891	$ 140,647	$ 145,569
O & M	$ 1,531,051	$ 1,584,637	$ 277,461	$ 287,172	$ 287,172
FEE	$ 5,063,574	$ 5,696,937	$ 3,242,697	$ 4,176,968	$ 4,653,142
NAE EXPENDITURES	$ 1,939,540	$ 2,007,424	$ 2,077,684	$ 2,150,403	$ 2,225,667
SEDIMENT SAMPLING & WQM	$ 961,740	$ 995,401	$ 1,030,240	$ 1,066,299	$ 1,103,619
DATABASE O&M & WEB	$ 296,250	$ 306,618	$ 317,350	$ 328,457	$ 339,953
SUBTOTAL	**$ 16,429,536**	**$ 17,460,708**	**$ 14,055,561**	**$ 15,368,282**	**$ 16,676,303**
REMAINING FUNDING	$ 63,570,464	$ 67,357,437	$ 66,479,876	$ 95,572,090	$ 111,159,192
REMAINING FUNDING AFTER 1ST ACTIVITY(IES) FOR SEASON	$ 8,323,145	$ 10,176,462	$ 33,204,993	$ 86,666,580	$ 81,387,272
REMAINING FUNDING -or- (FUNDING NEEDED)	$ 4,818,145	$ 535,437	$ 30,940,372	$ 47,835,495	$ 58,800,296
APPLICABLE UNIT RATE TSCA HYD DREDGING ($/CY)	307	318			
APPLICABLE UNIT RATE SILT CURTAIN ($/DAY)			218,995	226,660	
APPLICABLE UNIT RATE MECHANICAL DREDGING - LH ($/CY)			14		
APPLICABLE UNIT RATE MECHANICAL DREDGING - UH ($/CY)				87	91
APPLICABLE UNIT RATE MECHANICAL NON-SUPERFUND ($/CY)				87	
APPLICABLE UNIT RATE WETLAND EXCAVATION ($/CY)				788	816

# OF DREDGING DAYS SUPERFUND MECHANICAL			112	113	113
# OF DREDGING DAYS SUPERFUND HYDRAULIC OR WETLANDS	204	204	0	80	80
# OF DAYS TO INSTALL SILT CURTAIN		0	30	30	0
# OF DREDGING DAYS MECHANICAL NON-SUPERFUND				103	
VOLUME DREDGED NON-SUPERFUND (CY)				51,429	
VOLUME DREDGED SUPERFUND HYDRAULIC (CY)	180,000	180,000	0	0	0
CUMULATIVE VOLUME SUPERFUND (CY)	180,000	360,000	517,222	653,836	790,450
VOLUME DREDGED SUPERFUND MECHANICAL - UH (CY)			0	112,626	112,626
VOLUME DREDGED SUPERFUND MECHANICAL - LH (CY)			157,222	0	0
WETLANDS REMEDIATED (CY)				23,988	23,988
CUMULATIVE WETLANDS REMEDIATED (CY)				23,988	47,976
CAD CELL ALTERNATIVE FIXED COSTS					
PURCHASE MARINE EQUIPMENT			$ 4,620,100		
TERC RECOMPETE			$ 1,053,447		
INSTALL SILT CURTAINS			$ 6,569,864	$ 6,799,809	
REMOVE SILT CURTAIN & ADD CAP CAD CELL				$ 4,405,716	$ 3,647,420
DEMOB AREAS C&D			$ 9,541,569		
NSTAR CROSSING	$ 3,105,000				
MARSH ISLAND RESTORATION				$ 3,266,137	
EMPTY CELL #1 AND CAP DDA (AREA C)					$ 18,496,069
MUDFLAT RESTORATION			$ 11,489,904		
NARRAGANSETT LTM ROUNDS #5, #6	$ 400,000				$ 443,487
CONSTRUCT LHCC		$ 9,641,025			